

Warm Up

$$\textcircled{1} (x-9)(x+2)$$

$$\textcircled{2} (x-3)(x+6)$$

$$\textcircled{3} (2x+5)(4x-10)$$

$$\textcircled{4} (3x-7)(x+6)$$

$$\textcircled{5} 4x^2y(3x+6y+4z)$$

$$\textcircled{3} 8x^2-50$$

$$2(4x^2-25)$$

$$2(4x^2+0x-25)$$

$$2(2x-5)(2x+5)$$

| | | |
|---|----------|----|
| 2 | \times | -5 |
| 2 | \times | 5 |

$$\begin{array}{r} 10 \\ -10 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 4 \\ 1 \end{array} \times \begin{array}{r} 5 \\ 5 \end{array}$$

$$\textcircled{6} (x-9)(x+9)$$

$$\textcircled{7} (4x-2)(3x+1) = \boxed{2(2x-1)(3x+1)}$$

$(2x-1) \cdot 2 \cdot (3x+1)$

$$\textcircled{8} 2a^2(4b+3ab+2x)$$

$$(2x-1)(6x+2)$$

$$\textcircled{9} (3x+7)(2x-9)$$

$$(6x+2)(2x-1)$$

$$3x^2 + 11x - 42$$

$$(3x \overset{-7}{\cancel{7}})(x \overset{+6}{\cancel{6}})$$

~~2~~

$$\begin{array}{r} 3 \times +21 \\ 1 \times -2 \end{array}$$

$$\begin{array}{r} +21 \\ -6 \\ \hline +15 \end{array}$$

| | | |
|---|--------------|----|
| 3 | x | -6 |
| 1 | x | 7 |

$$\begin{array}{r} -6 \\ 21 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 3 \times -7 \\ 1 \times 6 \end{array}$$

$$\begin{array}{r} -7 \\ 18 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 3 \times -14 \\ 1 \times 3 \end{array} \quad \begin{array}{r} -14 \\ 9 \end{array}$$

$$3) (2x+3)(x-4)$$

$$4) (3x+2)(x-5)$$

$$5) (2a-1)(a+4)$$

$$6) (3x-1)(x+3)$$

$$7) (2x-7)(x+3)$$

$$2x^2 + 6x - 7x - 21$$

$$2x^2 - x - 21$$

$$8) (3m-1)(2m+5)$$

$$9) (4x-5)(2x+1)$$

$$10) (4a-1)(4a-1)$$

$$11) (5x-1)(x-2)$$

$$12) (3y-8)(y+1)$$

Grouping

$$(x^3 + x^2)(4x - 4)$$

$$x^2(x+1) - 4(x+1)$$

$$(x+1)(x^2 - 4)$$

$$\textcircled{1} (x^3 - x^2)(-9x + 9)$$

$$x^2(x-1) - 9(x-1)$$

$$(x-1)(x^2 - 9)$$

$$(x-1)(x-3)(x+3)$$

$$\textcircled{2} (x^3 - x)(+5x^2 - 5)$$

$$x(x^2 - 1) + 5(x^2 - 1)$$

$$(x^2 - 1)(x + 5)$$

$$(x+1)(x-1)(x+5)$$

$$\textcircled{3} (x^3 - 3x^2)(-16x + 48)$$

$$x^2(x-3) - 16(x-3)$$

$$(x-3)(x^2 - 16)$$

$$(x-3)(x+4)(x-4)$$

$$\textcircled{4} (x^3 + x^2)(x+1)$$

$$x^2(x+1) + 1(x+1)$$

$$(x+1)(x^2+1)$$

$$\textcircled{5} (x^2+10)(x+3)$$

$$\textcircled{6} (x^2+9)(2x-5)$$

$$\textcircled{7} (x-2)(3x^2+1)$$

$$\textcircled{8} (x^2-3)(3x-2)$$

$$\#9) (4x^4 - 3x^3)(16x+12)$$

$$x^3(4x-3) - 4(4x-3)$$

$$(x^3-4)(4x-3)$$

Diff. of Cubes

$$\textcircled{1} \quad x^3 - 8$$

$$\swarrow (-2)^3$$

$$(x^3 - 8) \div (x - 2)$$

$$(x - 2)(x^2 + 2x + 4)$$

$$(-2)^3$$

$$\begin{array}{c} 10 \\ \swarrow \quad \searrow \\ 2 \quad 5 \end{array}$$

$$10 = 2 \cdot 5$$

$$\sqrt[3]{-8}$$

$$\begin{array}{r|rrrr} 2 & 1 & 0 & 0 & -8 \\ & \downarrow & & & \\ & 2 & 4 & 8 & \\ \hline & x^2 + 2x + 4 & & 0 & \end{array}$$

$$\textcircled{2} \quad x^3 + 64 \rightarrow (4)^3$$

$$\sqrt[3]{(64)} = 4$$

$$(x^3 + 64) \div (x + 4)$$

$$\begin{array}{r|rrrr} -4 & 1 & 0 & 0 & 64 \\ & \downarrow & & & \\ & & -4 & 16 & -64 \\ \hline & & x^2 - 4x + 16 & & 0 \end{array}$$

$$(x+4)(x^2-4x+16)$$

④ $5x^3 - 5$

*pull out a GCF first

⑤ $x^3 - 216$

⑥ $x^3 + 125$

$$36x^4 - 9x^2$$
$$9x^2(4x^2 - 1)$$
$$9x^2(2x - 1)(2x + 1)$$

$$x^4 + 6x^2 + 9$$
$$(x^2 + 3)(x^2 + 3)$$

$$x^2 + 6x + 9$$
$$(x + 3)(x + 3)$$

$$\textcircled{2} \quad x^4 - x^2 - 6$$
$$(x^2 - 3)(x^2 + 2)$$

$$\textcircled{3} \quad x^4 - 16x^2 + 64$$
$$(x^2 - 8)(x^2 - 8)$$